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TRANSFORMATION TOWARDS SUSTAINABLE
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Designing evidence-based and context-specific hygiene programs in emergencies: could there be an app for that?

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When a humanitarian crisis occurs the disease risk associated with faecal-oral pathogens substantially increases. Encouraging crisis-affected populations to wash their hands with soap has therefore been a cornerstone of humanitarian response for decades. Recent literature reviews have highlighted that current approaches to hygiene programming are dated and insufficient to realise actual behaviour change. This research explored the factors that determine hygiene behaviour in emergencies and the barriers that prevent humanitarian actors from improving hygiene program design. This was done by conducting qualitative research in Iraq and the Democratic Republic of Congo and interviews with global and national humanitarian agencies. Humanitarian actors felt that hygiene behaviour change was the remit of experts and that current guides are overly generic and hard to adapt and apply. The findings from this research are being used to develop a software-based tool to aid practitioners in designing rapid, evidence-based and context-specific programs in emergencies.

Why does hygiene matter in emergencies?

Humanitarian emergencies such as disasters, disease outbreaks or armed conflicts cause displacement of populations, the destruction of social systems and infrastructure and present increased disease risks [1]. These conditions create the ideal environment for the spread of communicable diseases. Of particular concern are communicable diseases which transmit through a faecal-oral route. Faecal-oral pathogens include diarrhoeal diseases, some respiratory infections and many outbreak-related diseases (e.g. cholera) and are a leading cause of preventable illness and death across all types of humanitarian crises [2]. Handwashing with soap is one of the most effective preventative strategies for the control of faecal-oral pathogens [3, 4]. It has been calculated that in non-emergency settings improved handwashing with soap could avert 607,000 deaths among children under five, annually [5].

Current hygiene programming during crises

Recent systematic reviews of water, sanitation and hygiene (WASH) interventions in emergencies have highlighted the absence of research about hygiene behaviour change in these settings [6, 7]. These reviews identified that hygiene interventions in emergencies usually involve the provision of hardware (e.g. soap, hygiene kits or handwashing stations) with limited strategies for behaviour change to support adoption and use [7]. Secondly, the hygiene promotion that is done tends to adopt a medicalised, knowledge-heavy approach, [8, 9] something that doesn't appear to have a major influence on handwashing in stable settings [10-18]. Literature reviews have described this as a "missed opportunity" and there has been a call for different types of study designs, particularly for those of an anthropological or sociological nature [6, 8].

What are the determinants of handwashing behaviour in humanitarian crises?

Over the last decade substantial research and programmatic investment have gone into better understanding the determinants of people's handwashing behaviour. This body of literature has highlighted determinants

such as social norms; characteristics of the physical environment where handwashing takes place; the availability of soap and water; disgust associated with visible dirt; the influence of social networks; and many more. Handwashing interventions which have been developed based on an understanding of these determinants have been proven to change behaviour [19, 20]. These determinants are also well documented in behavioural theories commonly used in the water, sanitation and hygiene (WASH) sector such as Barrier Analysis [21], RANAS (Risk, Attitudes, Norms, Abilities, and Self-regulation) [22], BCD (Behaviour Centred Design) [23], IBM-WASH (the Integrated Behaviour Model for WASH) [24] and FOAM (Focus on Opportunity, Ability, and Motivation) [25]. However, this research base and these theories are derived from work conducted in stable settings. When a humanitarian crisis occurs, whether it be a disease outbreak, a disaster or an armed conflict, the social and physical environments of the affected population are disrupted and to date we have understood little about how hygiene behaviour responds.

As part of our research we undertook exploratory qualitative research in two types of emergencies: an armed conflict (Iraq) and a disease outbreak (cholera in the Democratic Republic of the Congo - DRC). The research used a range of participatory methods including observation, routine scripting, trials of improved behaviour, motive characterisation, free-listing and ranking of hygiene problems, social network mapping, risk perception scaling and norm assessments. Barrier Analysis surveys were also conducted in both locations.

The qualitative research in Iraq documented an increase in handwashing post-displacement. Handwashing was motivated by an increased perceived risk of disease; a heightened sense of disgust towards their surroundings; a desire to feel refreshed during the extreme heat of the Iraqi summer; and a desire to re-establish familiar routines in an attempt to reclaim agency and normalcy within their lives. The influence of social networks and norms decreased due to separation from 'valued others' and because the psychological toll of the crisis reduced social interactions.

In DRC we found that although cholera is still feared, it is so widespread that fear is insufficient to motivate handwashing behaviour. People made psychological trade-offs which resulted in soap rarely being purchased and only being used for laundry and bathing. The rare adverse outcomes of cholera were discounted by beliefs that 'black people don't die of germs' and that it is natural for children to get disease. As in Iraq, a perceived loss of control and psychological trauma also decreased hygiene behaviour. In both settings, attractive and easy-to-use handwashing facilities were critical for enabling practice, yet were rarely available.

What do practitioners need to be able to improve practice?

As part of our research we interviewed representatives of the Global WASH Cluster and the national WASH clusters in Iraq and DRC. These individuals included representatives from governments, UN agencies, international non-government organisations (INGOs) and local non-government organisations (local NGOs). The aim of these interviews was to understand more about current hygiene programming, including how such programs are designed and the identification of constraints that humanitarian actors have to operate within. The latter was particularly important, as any potential solution needs to be responsive to these constraints.

Our findings mirrored previous literature reviews, in that current hygiene promotion tends to be based on bio-medical education models and primarily involves house-to-house visits, activities at schools or larger events (e.g. for global handwashing day). Hygiene kit distributions were common as was the provision of handwashing facilities. Participants mainly relied on their personal expertise when designing programs. For example, staff primarily used the resources they were personally familiar with, even if their organisation had developed processes and guides for the development of hygiene programs. Participants explained that this was because many guides were too generic and hard too adapt to their context within the time constraints they faced. Many actors were also aware of emerging evidence about more innovative hygiene programs but were unsure how to apply this to their settings. Most actors undertook community assessments in the early phases of an emergency but these were not standardised. The assessments primarily sought to prioritise WASH behaviours but did not normally explore behavioural determinants beyond knowledge. Practitioners did not have a clear process for utilising the information from assessments to shape the program design and this often resulted in relatively uniform projects being delivered across countries and contexts. The factors that prevented humanitarian actors from improving the way they designed and delivered programs were: high staff turnover; short program life-cycles; perceived pressure from donors to stick with original plans rather than being responsive to the changing situation; capacity limitations; the perceived need to act rapidly;

the need to be consistent in messaging; negotiating and making compromises due to local politics; relationships between head offices and local offices and INGOs and local NGOs; and security limitations. Many of those interviewed felt that they were capable of distributing hygiene products and teaching people about hygiene but that hygiene behaviour change was the remit of experts. Since hiring behaviour change consultants was rarely feasible in an emergency and was not considered sustainable, this prevented improved program design.

Could a software-based solution change the way we do things in the sector?

Our research to date has helped us to identify key determinants of handwashing behaviour in humanitarian contexts and map the needs of program designers. It is clear that there is no one perfect hygiene program that would work in all contexts. Therefore, improving practice requires a decision-making tool which helps humanitarian actors to design rapid, evidence-based and context-specific interventions. Our findings suggest that such a 'solution' would have to address the following needs within the humanitarian WASH sector:

- Improving capacity (at all levels) to contribute to hygiene behaviour change programs;
- A set of rapid methods for assessing behavioural determinants;
- A clear step-by-step process for designing handwashing interventions;
- A way of enabling practitioners to draw on evidence about what works to enable handwashing behaviour change;
- Ways of adapting generic recommendations to suit the local context.

We believe that the most appropriate format for such a 'solution' would be a software-based decision-making tool. This is because current change theories and guidelines tend to be written in long, hard to navigate manuals which typically require training or external expertise to implement. When program strategies and evidence about what works are delivered in this way there is a tendency for people to not use the materials at all. In contrast, software-based solutions have several important benefits. Firstly, they create a more dynamic and engaging user experience. The software will utilise a range of video guides, photos and interactive formats so that the new tools and approaches are appealing and easy to replicate irrespective of prior expertise. Less effort will be required to understand how the tool works as the software 'walks' the user through the process. This removes a significant barrier to uptake and use and hopefully will make hygiene behaviour change seem like a less daunting task. Secondly, software can provide a platform for users to receive remote support from experts and this can overcome barriers encountered when applying the tool to a specific context. This constant interaction with users will allow us to improve the software on an ongoing basis and collect global data about hygiene programming that could lead to further improvements in the sector. Thirdly, software is a more convenient format as users can take it with them, wherever they are, on a mobile device or laptop. The software will also operate entirely offline, meaning that users in remote locations, with limited internet, will still be able to use it to its full potential.

What would the decision-making software look like?

There will be decision-making matrix which underpins the software. This will be developed by behaviour change experts and based on a broad range of evidence about what works to change hygiene behaviour. The users will have the opportunity to engage with this theory as much or as little as they wish.

A user will download the free software to their laptop or mobile device, they will be asked to log in by entering some basic information about their location, organization and role and will be given information about how data will be collected through the app and used. They will then choose their language preference (English, French, Arabic or Spanish) and be taken through a series of 'on-boarding' pages which inform them about what to expect from the software or application, it's functions and how to navigate through it. The software will guide users through a set of screens that present the user with multiple-choice questions about the context where they are working. These questions will start broadly with questions such as: type of humanitarian emergency; the duration of the current humanitarian emergency; the state of the region prior to the current crisis; whether people have been displaced; the level of literacy; the state of water and sanitation availability; and whether humanitarian actors are involved in the provision of WASH infrastructure and products.

Once this first phase is complete the user will be supported to undertake some rapid formative research. A set of five rapid formative research methods and guides are currently under development. These methods are modified versions of the qualitative methods that were used in the exploratory research in Iraq and DRC. The intention behind each of the rapid methods is that they can be learned quickly, implemented by staff

with no prior qualitative research experience, and will generate meaningful results that will allow programs to be adapted to local contexts. It is anticipated that all methods could be learned and implemented in three to five days, making them comparable or quicker than current assessment approaches. For each method there will be a two-page written guide and a five-minute interactive video which will allow the user to test their understanding of the method. Once these rapid formative research methods have been implemented and analysed users will proceed to answer a set of questions related to their findings. These questions may include things like: is handwashing considered a priority among the population?; are soap and water available nearby toilets and kitchens?; is fear of disease an issue?; who is likely to influence behaviour?; is handwashing part of routines or habits?; where do people get their information from?; what motives are important in this context?; and how do people feel towards their new physical and social environment in comparison to their place of origin?

The last phase of the software will ask the user a set of practical programmatic questions such as: how much time do you have to develop and implement your intervention?; what delivery channels are available to you?; is there a creative agency/marketing company available that could help you design intervention materials?; what is your approximate budget?; what is the capacity of those who will deliver your program?; are their security or political restrictions on what can be done?; and what scale do you need to deliver your program at?

Based on the users answers to each of the matrix questions, they will be directed towards a final page of tailored recommendations for their context. The recommendations will take the form of specific behaviour change techniques that have been trialled in other contexts and have been found to be effective. This will be complemented by pictorial examples of what these may look like in practice and other types of guidance material (methodologies, guides and references). Users will have the option to print, email or share their answers to the multiple-choice questions and the recommendations that were generated, thus allowing easy communication between staff at different levels of an organization or between different actors in the WASH cluster.

Our design process

The development of the rapid formative research tools:
So far the written guides for the formative research methods have been pilot-tested in Iraq, DRC and Zimbabwe (a drought-affected region). These initial tests indicated that the tools were acceptable and applicable to all of these contexts and although there was some initial resistance to trialling these very new approaches, practitioners ultimately found them fun to undertake and felt that they generated new insights. The tests also highlighted areas to improve in terms of the clarity of instructions. Based on this we are now developing the five-minute videos for each method and then will pilot the videos and written guides in three additional settings.

Simulation workshops:
We are currently developing the decision-making matrix that will underpin the software. As with any innovation it is impossible to get it right the first time and therefore it will be designed iteratively with input from humanitarian actors at key stages. This will primarily be done through simulation workshops. At these events potential users will be presented with a prototype of the software. They will be given a case study of a particular crisis (or at the national level simulation they will use data from their country) and will use the software to design an appropriate intervention. This will provide an opportunity to identify shortfalls of the software and tailor it to better suit the needs of practitioners. Three simulation events will be held in total – two with global actors and one at a national level.

Field-testing:
Once we have refined a strong prototype we will field test this in four countries, representing different geographies and different types of emergency. The field testing will be carried out by local staff who will receive little guidance on what to do (as it is hoped the software will be fully self-explanatory). The process will be observed by our team so that we can identify barriers in understanding as well as technological and logistical limitations. Following each field-test we will further refine the software.

Pilot phase:

We anticipate launching the software towards the end of 2019. This will be followed by a six-month pilot phase where we will encourage organisations and governments all over the world to trial the software in the places where they are working and provide us live feedback. This feedback will lead to the finalisation of the software in March 2020.

Acknowledgements

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